

STATE OF CALIFORNIA

Department of Transportation Specification

**Red Primer, High Solids Phenolic Type
(Formula PB-201C)**

Scope

This specification covers a pre-mixed solvent borne paint formulated for use as a prime coat on properly prepared metal surfaces. This primer has a volatile organic content (VOC) that exceeds the maximum limit in some air quality management districts.

This coating is intended for spray application. Limited application can be made by brushing and rolling.

Requirements

This specification is intended to specify paint that will meet service requirements for bridge construction and maintenance. All properties listed shall be maintained for a minimum of one year after acceptance. If the vendor is making this paint for the first time, the Transportation Laboratory in Sacramento must be consulted.

Materials:

The raw materials for use in the paint formula shall conform to the specifications designated .

Quality Assurance

All paint intended for use by the Department must be sampled, tested and approved by the Transportation Laboratory before shipment. The manufacturer shall take a representative one-quart sample of each batch of paint and ship the samples to the Transportation Lab for approval, unless other arrangements have been made. Raw materials and copies of batch records used in the manufacturer of the paint shall be submitted if requested.

Transportation Laboratory, Chemical Testing Branch, 5900 Folsom Blvd., Sacramento, CA 95819, attn. Lisa Dobeck, (916) 227-7291

A batch shall be that amount of paint that was manufactured and packaged in a single operation. The paint container shall be labeled with, but not limited to, the State Specification number, date of manufacturer and batch number. The Department also reserved the right to retest any batch after delivery. Results from such retesting shall prevail over all other tests and will be the basis of rejection. Material not meeting the specification shall be removed and replaced by the supplier at their expense, including all cost for handling, retesting and shipping.

All tests shall be conducted in accordance with the appropriate ASTM test methods referenced under the "Characteristics of Mixed Paint" section of the document and methods used by the Transportation Laboratory.

Description:

This specification covers a red, ready-mixed, air-drying, high solids, corrosion resistant, phenolic resin/tung oil primer. This coating is intended for spray application to blast-cleaned steel surfaces exposed to the air.

Composition

		PIGMENT	
<u>Component</u>		<u>Weight percent</u>	<u>(LB/100 gallons)</u>
Magnesium Silicate	(1)	16.88	194
Zinc Phosphate	(2)	14.88	171
Red Iron Oxide	(3)	16.54	190
Silica	(4)	0.26	3
VEHICLE			
Phenolic Resin/Tung Oil Varnish	(5)	44.82	515
Aliphatic Thinner, MIL-PRF-680A(1), Type I		5.4	62
Zirconium Drier, ASTM D600, Class A	(6%)	0.43	4.9
Cobalt Drier, ASTM D600, Class B	(6%)	0.22	2.5
Calcium Drier, ASTM D600, Class B	(5%)	0.17	1.9
Anti-skinning Agent, Oxime Type		0.41	4.7

Characteristics:

Volatile Organic Content, g/L, ASTM D 3960	248
Flash Point, °F, ASTM D 3828	120
Density, grams per milliliter, ASTM D-1475	1.40 to 1.43
Pigment by weight of paint, percent, ASTM D-2371	47.5 to 49.5
Nonvolatile content, weight percent, ASTM D-2369, Procedure B	81.8 to 83.2
Nonvolatile content, volume percent, ASTM D-2697	70.8 to 72.4
Fineness of grind, Hegman, ASTM D-1210	4 to 5
Consistency, ASTM D-562, grams (Equivalent KU)	170 to 230 (76 to 86)
Drying time, 75 µm wet film, ASTM D-1640	
set to touch, hours	2.5 max.
dry-hard, hours	8 max.

Color to essentially match Color Chip No. 197 on file at the Transportation Laboratory.

- (1) Magnesium Silicate, platey shape, specific gravity 2.7 ± 0.1 , oil absorption* 50 ± 3 , pH $8.8 \pm .3$, Hegman fineness +6.0, 100% passing 45 μm mesh screen, CaO content 0.5% max., water soluble matter 1.0% max.
- (2) Essentially $\text{Zn}_3(\text{PO}_4)_2 \cdot 2\text{H}_2\text{O}$, specific gravity 3.4 ± 0.1 , oil absorption* 20 ± 3 , average particle size less than 10 μm . Water soluble matter less than 0.2%.
- (3) Synthetic iron oxide, spheroidal particle shape, Fe_2O_3 98% minimum, oil absorption* 20 ± 3 , specific gravity 5.2 ± 0.1 , 99.9% passing 45 μm mesh screen. Water soluble matter 0.15% maximum, easy dispersible type recommended.
- (4) Precipitated hydrophobic silica, surface area N_2 B.E.T. $120 \pm 15 \text{ m}^2/\text{g}$, mean particle diameter 3 μm , drying loss at 150°C 1-2%, ignition loss (2 hours at 1000°C) 5-6%, SiO_2 content 98% minimum based on substance ignited for two hours at 1000°C .
- (5) Phenolic resin/tung oil varnish shall be a 75% non-volatile solution composed of the following:

<u>Component</u>	<u>**Weight percent of varnish</u>	<u>(LB/100 gallons of finished paint)</u>
Georgia Pacific CK-2500 Resin	24.27	125
Aliphatic Thinner TT-T-291F, Type I	20.97	108
Xylene ASTM D846	4.27	22
Tung Oil ASTM D12	50.49	260

Dissolve CK-2500 in xylene and aliphatic thinner. Add tung oil slowly while stirring.

* Oil absorption values determined according to ASTM D-281.

♣♣ Varnish comprises 44.82 percent of the paint by weight.